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USSR

MARINOV, B. S., L'VOV, K. M., SUKHORUKOV, B. I., KAYUSHIN, I. P.,  
POSTNIKOVA, G. B., Institute of Biophysics, Academy of Sciences USSR,  
Pushchino (Moscow Oblast)

"On the Possibility of Using Iminoxyl Radicals to Detect Unpaired Electrons  
in Biological Systems"

Moscow, Biofizika, Vol 16, No 1, 1971, pp 337-340

Abstract: The interaction of iminoxyl radicals with amino acids and proteins in the excited state and with mitochondria (in which active transport of electrons occurs,) is studied. It is noted that stable iminoxyl radicals are widely used as spin labels to analyze conformation changes in macromolecules, and that it is also considered possible to use them to study electron transfer in biological systems. The breakdown of the radicals was observed in solutions of tryptophan, tyrosine, and cysteine. A typical kinetic curve for the photochemical reaction of the radicals with protein shows that the rate of breakdown of the radicals in water is considerably lower than the rate of breakdown in the presence of protein; the reaction does not proceed in the dark. It is hypothesized that the radicals interact with a photoinduced paramagnetic state of protein and that the breakdown of the radicals occurs  
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MARINOV, B. S., et al., Biofizika, Vol 16, No 1, 1971, pp 337-340

as a result of electron transfer to the radical from photoexcited paramagnetic centers of protein. It is shown that it is possible to use the radicals to detect and analyze paramagnetic states of protein having a short lifetime, as a result of which the concentration of unpaired proteins in a sample is slight (less than  $1 \cdot 10^{-10}$  spin). Electron transfer was shown with the aid of the radical in an aqueous solution in a dye-protein system and the feasibility of using the radicals to study oxidation-reduction processes in mitochondria was demonstrated.

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1/2 021 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--STUDY OF PARAMAGNETIC CENTERS PHOTOINDUCED IN AQUEOUS SOLUTIONS OF  
PROTEINS -U-  
AUTHOR--(02)-KAYUSHIN, L.P., LVOV, K.M. K

COUNTRY OF INFO--USSR

SOURCE--BIOFIZIKA 15(2): 235-238. ILLUS. 1970

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--AQUEOUS SOLUTION, PROTEIN, EPR SPECTRUM, UV LIGHT, VISIBLE  
LIGHT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605007/F09 STEP NO--UR/0217/70/015/002/0235/0238

CIRC ACCESSION NO--AP0139933

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--04DEC70

2/2 021

CIRC ACCESSION NO--AP0139933

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EPR SPECTRA AQUEOUS SOLUTIONS OF PROTEINS SUBJECTED TO THE EFFECT OF UV AND VISIBLE LIGHT AT TEMPERATURES ABOVE 0 C WERE OBTAINED. UNPAIRED ELECTRONS ARE STABILIZED BY PROTEIN MOLECULES. THE LIFE SPAN OF SUCH STATES AT TEMPERATURES ABOVE 0 C REACHES SEVERAL DOZENS OF SECONDS. FACILITY: INST. BIOL. PHYS., ACAD. SCI. USSR, PUSHCHINO-ON-OKA, USSR.

UNCLASSIFIED

1/2 024 UNCLASSIFIED PROCESSING DATE--11 SEPT 80  
TITLE--STRUCTURE OF PARAMAGNETIC CENTERS AND THEIR PHOTOCHEMICAL  
TRANSFORMATIONS IN A GAMMA IRRADIATED SINGLE CRYSTAL OF CYSTEINE  
AUTHOR--KRIVENKO, V.G., KAYUSHIN, L.P., PULATOVA, M.K.  
COUNTRY OF INFO--USSR  
SOURCE--KHIM. VYS. ENERG. 1970, 4(1), 49-55  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, CHEMISTRY  
TOPIC TAGS--AMINO ACID, GAMMA IRRADIATION, EPR SPECTRUM, PARAMAGNETISM,  
PHOTOCHEMISTRY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1986/0501 STEP NO--UR/0456/70/004/001/0049/0055  
CIRC ACCESSION NO--AP0102506  
UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0102506

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A CYSTEINE HYDROCHLORIDE SINGLE CRYSTAL WAS IRRADIATED WITH PRIME60 CO TO A DOSE OF 10 MEGARADS AT 77DEGREESK AND THE EPR SPECTRUM WAS ANALYZED. PARAMAGNETIC CENTERS OF 3 TYPES WERE FOUND. TWO WERE LOCALIZED ON THE S ATOM AND THE 3RD, A K RADICAL, WAS LOCALIZED ON A C ATOM. WHEN IRRADIATED WITH LIGHT (340-450 NM) THE S-C BOND IN HS PRIME NEGATIVE CH SUB2 C(NH SUB3 CL)HCO SUB2 H (I) IS BROKEN AND .CH SUB2 C(NH SUB3 CL)HCO SUB2 H IS FORMED. ABOVE 290DEGREESK, RADICALS .SCH SUB2 C(NH SUB3 CL)HCO SUB2 H AND PRIME NEGATIVE S:CHC(NH SUB3 CL) HCO SUB2 H ARE FORMED FROM PYROLYSIS OF I.

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USSR

KAYUSHIN, L.P. and L'VOV, K.M., Institute of Biophysics, Academy of Sciences  
USSR

"Study of Paramagnetic Centers Photoinduced in Aqueous Protein Solutions"

Moscow, Biofizika, Vol 15, No 2, Mar/Apr 70, pp 235-238

Abstract: The electron paramagnetic resonance (EPR) of aqueous protein solutions exposed to ultraviolet and visible light was studied. Study of the properties of photoinduced free radicals in aqueous protein solutions at temperatures greater than 0°C will be valuable in elucidating certain recently discovered properties of protein molecules in metastable excited states. Studies were conducted with a radio spectrometer specially adapted to measure the EPR absorption of samples containing a large amount of water (tissue, solutions, and suspensions). For each sample, the EPR spectrum was recorded during illumination and immediately thereafter. The magnitude of the signal persisting in the darkness represented the stability of unpaired electrons. Samples of glycerinated muscles and solutions of pepsin and ribonuclease were investigated. All of them displayed EPR spectra when illuminated with ultraviolet or visible light. Unpaired electrons were stabilized by protein molecules. This state persisted for a long time in darkness. Paramagnetic centers were formed when light was turned on much faster than they disappeared after light was turned off. They persisted in

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KAYUSHIN, L.P., et al, Biofizika, Vol 15, No 2, Mar/Apr 70, pp 235-238

the darkness for 30-40 seconds, with 30% of them remaining stable for several minutes. No EPR spectra were observed when an aqueous solution of methylene blue and eosin was illuminated with either visible or ultraviolet light.

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1/2 013 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--THE NATURE OF PARAMAGNETIC CENTERS AND THEIR PHOTOCHEMICAL  
TRANSITIONS IN MONOCRYSTAL OF HYDROCHLORIDE L TYROSINE AT 77DEGREESK  
AUTHOR--(03)-PASCYAN, V.G., PULATOVA, M.K., KAYUSHIN, L.P.  
COUNTRY OF INFO--USSR  
SOURCE--BIOFIZIKA 15(1): 12-19. ILLUS. 1970  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--TYROSINE, GAMMA RADIATION, ELECTRON PARAMAGNETIC RESONANCE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAHE--3003/0921 STEP NO--UR/0217/70/015/001/0012/0019  
CIRC ACCESSION NO---AP0129986  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0129986

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE WORK DEALS WITH THE EPR STUDY OF THE NATURE OF PARAMAGNETIC CENTERS ARISING UNDER GAMMA IRRADIATION AT 77 K IN SINGLE CRYSTALS OF HYDROCHLORIDE L TYROSINE. THE EPR SPECTRUM OF A GAMMA IRRADIATED SINGLE CRYSTAL OF HYDROCHLORIDE L TYROSINE IS COMPOSED OF 4 COMPONENTS, A BROAD ASYMMETRIC DOUBLET, A SINGLET, AND A MULTIPLY. THE PARAMAGNETIC CENTER RESPONSIBLE FOR THE 1ST EPR SIGNAL IS C1. AT 77 K THE IONIZATION OF THE MOLECULE TAKES PLACE, WHICH RESULTS IN THE FORMATION OF ANION RADICALS (EPR SINGLET) OF TYROSINE WITH THE LOCALIZATION OF UNPAIRED ELECTRONS ON THE BENZENE RING. THE BREAKAGE OF THE C-N BOND IS A SECONDARY ONE DUE TO THE TRAPPING OF THE ELECTRON BY THE CHARGED AMINO GROUP OF THE TYROSINE MOLECULE (EPR MULTIPLY). FACILITY: INST. BIOL. PHYS., ACADE. SCI. USSR, PUSHCHINO-ON-OKA, USSR.

UNCLASSIFIED

USSR

UDC 621.391.154

ZLOTNIKOV, YU.S., KAYZER, I.Z.

"Modeling On An Electronic Digital Computer Of Algorithms For Decoding Cyclic Codes, Correcting Errors"

Elektrosvyaz', No 2, 1972, pp 70-72

Abstract: The methods and results are presented of modeling on an electronic digital computer of systems of data transmission with cyclic correcting codes (including codes for correcting errors in a compound channel), during the effect of a flow of errors characteristic of shortwave and wire channels. Two types of devices are described which were used as sources of errors in the channel. 1 fig. 1 tab. 6 ref. Received, 14 Jan 71.

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USSR

UDC 666.972:691.328:620.179

RYBAK, S. A., Candidate of Physico-Mathematical Sciences, and  
KAZACHENKO, Engineer

"Ultrasonic Exposure of Hidden Defects in Concrete of Prefabricated Monolithic Hydraulic Structures"

Moscow, Gidrotekhnicheskoye Stroitel'stvo, No 12, Dec 71,  
pp 10-11

Abstract : An experimental and theoretical investigation of the amplitude method of ultrasonic defectoscopy of concrete is described. The method is based on measuring the attenuation of ultrasound waves in concrete by their diffraction of internal defects, as blisters, cracks, et al. The special case of an internal defect of the form of a symmetrical disc is mathematically analyzed. Formulas are presented characterizing the ultrasonic field intensity behind the disc-like defect and the relative attenuation factor of ultrasound field amplitudes near and behind the defect. The experimental proof of the presented formulas is demonstrated in comparison with calculated values. For a reliable determination of internal defects in hydraulic concrete structures it is necessary that changes of amplitudes and propagation rates of ultrasonic waves in places with internal defects exceed by 3-4 times changes of the same characteristics in concrete without defects. Three illustr., seven formulas, four biblio. refs.

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K UDC 546.841.4 + 547.587.41

KOVALENKO, K. N., and KAZACHENKO, D. V., Rostov State University

"Thorium Dihydroxydimandelate"

Moscow, Zhurnal Neorganicheskoy Khimii, Vol 15, No 6, Jun 70,  
pp 1523-1526

Abstract: This study is a continuation of the work on thorium carboxylates; the results of physico-chemical and preparative investigations on the reaction of thorium nitrate with sodium mandelate in aqueous solution are reported. A series of solutions was prepared with constant concentration of thorium nitrate and varying molar ratio of thorium to sodium mandelate. The solutions were kept at 90°C in a thermostat for 24 hrs; in all cases precipitates were formed, which were separated from liquids. In the liquid phase, determinations were carried out on pH, thorium concentration, and electroconductivity. The curves of pH and electroconductivity are analogous to those obtained for the thorium nitrate-sodium salicylate system. From the examination of the thorium concentration it was shown that an exchange reaction took

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KOVALENKO, K. N., et al, Zhurnal Neorganicheskoy Khimii, Vol 15,  
No 6, Jun 70, pp 1523-1526

place with the formation of basic thorium dimandelate. A compound  $\text{Th}(\text{OH})_2(\text{C}_6\text{H}_5\text{CHOH}\cdot\text{COO})_2$  was isolated and was found to be soluble in methanol, ethanol, acetone, and dioxane. Its dipole moment was determined to be 2.8 D. Infrared spectra were taken in the range of  $1000\text{-}1750\text{ cm}^{-1}$  (NaCl prism) and  $2400\text{-}3500\text{ cm}^{-1}$  (LiF prism). Both the carbonyl and hydroxyl bands were absent in the product. The thermographic analysis showed that the compound begins to decompose at  $205^\circ\text{C}$ , with a maximum at  $300^\circ\text{C}$ . The density of thorium dihydroxydimandelate powder was found to be  $2.12\text{ g/cm}^3$  at  $25^\circ\text{C}$ .

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UDC 535.37

USSR

STEPANOV, B. I., KAZACHENKO, L. P.

"Universal Relationship Between Absorption and Emission Spectra Considering the Effect of the Solvent"

Minsk, Zhurnal Prikladnoy Spektroskopii, No. 5, May 71, pp 819-825

Abstract: A universal relationship between the absorption coefficient and the emission power derived earlier by the authors and presently used to calculate the properties of organic dye lasers is discussed. The relationship is valid in all cases when conditions used in the derivation process are satisfied. In certain cases it was established that temperatures determined on the basis of the spectra of solutions with the aid of the universal relationship differ from the temperature of the medium. This appears in viscous and frozen systems, especially in polar solvents for molecules with different dipole moments in the ground and excited electron states. Various reasons are advanced for the reasons for the difference in the temperatures of excited molecules and the medium. Some consider that thermal equilibrium of the oscillatory energy is not established in viscous and frozen systems during the excited state, due to a sharp decrease in the probability of its

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STEPANOV, B. I., KAZACHENKO, L. P., Zhurnal prikladnoy spektroskopii, No. 5, May 71, pp 819-825

exchange between excited molecules and the medium. This conclusion does not agree with the independence of the quantum yield of luminescence from the frequency of the exciting radiation. The authors consider more reasonable the hypothesis that the discrepancy between calculated and experimental temperatures is explained by a change in the so-called configuration or orientation distribution of molecules of the medium after an act of excitation. A universal relationship is derived here that is applicable to such systems. The relationship is valid when the time for establishing orientational equilibrium is much less than the duration of the excited electron state. The new universal relationship replaces the old for those systems in which an act of excitation causes a rapid reorientation of molecules of the solvent accompanied by a change in the magnitude of the electron energy without a change in the shape of the potential surfaces. Experimental data are presented to support the validity of the relationship derived.

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USSR

KAZACHENKOV, Yu. N.; ORLOV, V. V.

"Neutron Diffusion in a Polarized Proton Medium"

Moscow, Atomnaya Energiya; April, 1972; pp 297-300

ABSTRACT: This article concerns neutron diffusion in polarized proton screens. The authors derive a set of equations which describes the neutron transfer, taking into account spin-spin interaction. The albedos of polarized proton reflectors are shown to be less than those of similar nonpolarized reflectors. As an example, the authors carry out a calculation for a plane, infinite plutonium reactor having a 6-cm-thick water reflector. It has been found that the effective multiplication constant of a reactor having a polarized reflector is 2.7% less than that of a reactor having a similar nonpolarized reflector. In pulsed operation the smallest pulse half-width obtainable in a reactor having a polarized reflector is 1  $\mu$ sec.

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KAZACHENKOV, Yu. N. and ORLOV, V. V., Atomnaya Energiya, April 1972, pp 297-300

The authors propose a method for regulating such a reactor by providing a magnetic field normal to the screen polarization. In this case the albedo of the reflector is shown to increase and the corresponding effect to be directly proportional to the square of the magnetic field strength. Providing a magnetic field strength of about 13,000 oersteds is equivalent to decreasing the polarization of the reflector by a factor of two.

The article includes 18 equations and a figure showing the geometry for calculating the neutron polarization. There are 7 bibliographic references.

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1/2 034 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--HIGH SPEED DEFORMATION OF NICKEL SINGLE CRYSTALS -U-

AUTHOR--EPSHTEYN, G.N., KAZACHKOV, I.V. *K*

COUNTRY OF INFO--USSR

SOURCE--FIZ. METAL. METALLOVED. 1970, 29(1) 212-15

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--METAL DEFORMATION, DEFORMATION RATE, METAL SINGLE CRYSTAL,  
NICKEL ALLOY, HIGH PURITY METAL, ELECTROLYTIC METAL POLISHING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0627

STEP NO--UR/0126/70/029/001/0212/0215

CIRC ACCESSION NO--AP0105606

UNCLASSIFIED

2/2 034  
CIRC ACCESSION NO--AP0105606 UNCLASSIFIED PROCESSING DATE--11SEP70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PURE NI SINGLE CRYSTALS (99.97PERCENT PURE) GROWN BY DRAWING FROM THE MELT WERE USED IN THIS STUDY. SAMPLES SECTIONED FROM THE CRYSTAL WERE POLISHED ELECTROLYTICALLY IN 60PERCENT H SUB2 SO SUB4 AND ANNEALED AT 550DEGREES IN VACUUM. THE (110), (111), AND (112) ORIENTATIONS WERE SELECTED FOR THIS STUDY. THE SAMPLES WERE DEFORMED UP TO 20PERCENT. MICROHARDNESS WAS STUDIED ON ALL SINGLE CRYSTALS. FOR SINGLE CRYSTALS WITH THE (110) AND (111) ORIENTATIONS, THE STRENGTHENING AFTER THE PULSE AND THE STATIC LOADING IS THE SAME, WHICH IS CONFIRMED BY THE HARDNESS AND THE WIDTH OF THE X RAY LINE MEASUREMENTS. THE RESULTS OBTAINED ARE COMPREHENSIBLE WHEN EXAMD. TOGETHER WITH THE SCHMIDT ORIENTATION FACTOR FOR THE 12 SLIP SYSTEMS. THE PRESENT WORK CONFIRMS THE PREVIOUSLY OBTAINED CONCLUSIONS ON POLYCRYST. SAMPLES CONCERNING THE FACT THAT PULSE DEFORMATION PUTS INTO ACTION A LARGER NO. OF SLIP SYSTEMS. THIS CAN, HOWEVER, BE ACCOMPLISHED ONLY IN CRYSTALS WHICH ARE ORIENTED RELATIVE TO THE ACTING FORCE IN SUCH A WAY THAT A LARGE NO. OF SLIP SYSTEMS CAN BE PUT INTO ACTION. THIS HOLDS TRUE FOR CRYSTALS WITH ANY GIVEN TYPE OF LATTICE.

UNCLASSIFIED

1/2 014  
UNCLASSIFIED  
TITLE--DECAY OF POTASSIUM-44 AND SCANDIUM-44 -J- PROCESSING DATE--16OCT70  
AUTHOR--(02)-LEVKOVSKIY, V.N., KAZACHEVSKIY, I.V.  
COUNTRY OF INFO--USSR  
SOURCE--YAD. FIZ. 1970, 11(3), 483-4  
DATE PUBLISHED-----70  
SUBJECT AREAS--NUCLEAR SCIENCE AND TECHNOLOGY  
TOPIC TAGS--RADIOACTIVE DECAY SCHEME, POTASSIUM ISOTOPE, SCANDIUM ISOTOPE,  
GAMMA SPECTRUM, BETA SPECTRUM  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1991/1058 STEP NO--UR/0367/70/011/003/0483/0484  
CIRC ACCESSION NO--AP0110748  
UNCLASSIFIED

2/2 014 UNCLASSIFIED PROCESSING DATE--16OCT70  
 CIRC ACCESSION NO--AP0110748  
 ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. THE DECAY SCHEMES WERE ESTABLISHED BY GAMMA SPECTROSCOPY WITH GE(LI) DETECTORS AND BETA SCINTILLATION SPECTROMETRY. THE 1157 PLUS OR MINUS 1 KEV GAMMA LINE (INTENSITY REF., 100) OF PRIME44 K COINCIDED WITH THE 2151 PLUS OR MINUS 1 (38.4) AND 2518 PLUS OR MINUS 1 (14.6) GAMMA LINES, BUT THE GAMMA LINE 3661 PLUS OR MINUS 1 (10.4) APPARENTLY DID NOT. THE MAX. BETA ENERGY OF PRIME44 K, 5580 PLUS OR MINUS 80 KEV, SIGNIFICANTLY EXCEEDED THE PREVIOUSLY ACCEPTED VALUE OF 4910 KEV, WHICH WAS POSSIBLE BASED ON A FAULTY CALIBRATION, NOW EXTENDED TO 4913 AND 5100 KEV OF PRIME38 CL AND PRIME34 P. IN THE PRIME44 SC (3.9 HR) GAMMA SPECTRUM THE LINES 1157 PLUS OR MINUS 1 (100), 1499 PLUS OR MINUS 1 (0.9), AND 2656 PLUS OR MINUS (0.15) KEV WERE SEEN; IN THE PRIME44 SC (2.4 DAYS) SPECTRUM THE LINES 271 PLUS OR MINUS 1 (100), 1127 PLUS OR MINUS 2 (18.), AND 1000 PLUS OR MINUS 3 (SIMILAR TO 1.8) KEV WERE NOTED. FACILITY: INST. YAD. FIZ. ALMA-ATA, USSR.

UNCLASSIFIED

USSR

RYABOV, V. R., YUMATOVA, V. I., SAYENKO, M. I., Institute of Electric Welding  
im. Ye. O. Paton, An UkrSSR, KAZACHINSKAYA, N. V., Kiev Polytechnic Institute

"Use of the Method of Multifactor Planning of Experiments for Studies of  
Calorizing of Kh18N10T and Type 3 Steels Before Welding With Aluminum"

Kiev, Avtomaticheskaya Svarka, No 12, 1972, pp 34-37

Abstract: The dependence of diffusion layer thickness formed upon calorizing of Kh18N10T and type 3 steels on melt temperature, calorizing time, and specimen volume was studied. The influence of heating rate and cooling on growth of the diffusion layer was also studied. Mathematical dependences were produced, showing that in direct welding of aluminum with steel, calorizing and the production of bimetallic castings, the basic factor determining the thickness of the diffusion layer is the melt temperature. This provides technological possibilities for regulation of layer thickness. The influence of volume (mass) of the specimens is less significant.

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KAZACHKOV, I. P., Dnepropetrovsk Metallurgical Institute

"Thermal Effect of Deoxidation and Alloying Processes on Steel in Ladle. Report 2"

Moscow, IVUZ Chernaya Metallurgiya, No 3, 1971, pp 52-56.

Abstract: Report 1 presented calculation of the heat expended on heating and melting of solid ferroalloys in liquid steel, partially compensated by the heat of dissolution of certain components and chemical reactions of oxidation. The thermal effect of dissolution of elements introduced by ferroalloys is the difference between the heat of formation of the chemical compounds in the ferroalloys at 298°K and the heat of dissolution of the elements in the liquid steel. The formation of silicides and carbides of iron, manganese, and chromium and compounds of aluminum with iron, manganese, and titanium at 298°K is considered. The thermal effect of these processes of dissolution and alloying is calculated. The results of the calculations are presented in a table.

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UDC 669.18.046.516:621.746.32

USSR

KAZACHKOV, I. P., MELIKAYEV, N. P., DRUINSKIY, N. I., PARIMONCHIK, I. B.,  
and OFENGENDEN, Dnepropetrovsk Metallurgical Institute, Yermakov Ferroalloys  
Plant, and Donets Metallurgical Plant

"Melting Complex Alloys FKHMnS500 From Lean Iron-Manganese Ores and Their  
Use"

Moscow, Stal', No 9, Sep 73, pp 800-801

Abstract: The possibility has been indicated at the Yermakov Ferroalloys  
Plant for the industrial use of unconditioned Fe-Mn ores with a low phosphorus  
content (0.03-0.04%) for melting alloys of the ferrochromium-manganese-  
silicon type (30-40% Cr, 17-35% Mn, 10-13% Si, and 0.06-5.5% C). Tests  
were conducted in an arc furnace with a power rating of 1.2 mva. At the  
Donets Metallurgical Plant Economic effect of 1.0-1.15 rubles/ton was achieved  
by using alloy FKHMnS500 (38% Cr, 17.1% Mn, 12% Si, 5.2% C, 0.6% Al, 0.6%  
Ca + Mg, 0.020% S, and 0.040% P) for deoxidation and alloys steel 40Kh in  
the ladle. Distribution of elements in the rolled metal was uniform,  
mechanical properties were somewhat improved, general consumption of ferro-  
alloys during melting was diminished, loss of Cr, Mn, and Si was reduced by  
2.6, 2.0, and 1.1 times, respectively, and the P and N content in the steel  
was lowered. Four bibliographic references.

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USSR

KAZACHKOV, I. F. Dnepropetrovsk Metallurgical Institute

"Thermal Effect of Deoxidation and Alloying Processes on Steel in Ladle. Report 2"

Moscow, IVUZ Chernaya Metallurgiya, No 3, 1971, pp 52-56.

Abstract: Report 1 presented calculation of the heat expended on heating and melting of solid ferroalloys in liquid steel, partially compensated by the heat of dissolution of certain components and chemical reactions of oxidation. The thermal effect of dissolution of elements introduced by ferroalloys is the difference between the heat of formation of the chemical compounds in the ferroalloys at 298°K and the heat of dissolution of the elements in the liquid steel. The formation of silicides and carbides of iron, manganese, and chromium and compounds of aluminum with iron, manganese, and titanium at 298°K is considered. The thermal effect of these processes of dissolution and alloying is calculated. The results of the calculations are presented in a table.

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UDC 669.5'71:539.214

USSR

KAYBYSHEV, O. A., KAZACHKOV, I. V., BZHENVERG, V. M., Ufa Aviation Institute  
Imeni Ordzhonikidze

"Change in Structure and Peculiarities of Crystallographic Slipping During  
Superplastic Deformation of the Alloy Zn Plus 22% Al"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 36, No 6, Dec 73, pp  
1235-1241.

Abstract: The influence of structure on the mechanical properties of the alloy Zn plus 22% Al is studied under superplastic flow conditions. As the grain size increases, the maximum value of the high-speed stress sensitivity factor for flow and plasticity is shifted to lower deformation rates. Analysis of the microstructure shows that the growth of grains resulting from deformation increases with decreasing deformation rate. The correlation is experimentally shown between the mechanical properties of alloys under superplastic flow conditions and texture formation in the beta phase as a function of grain size and deformation rate.

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UDC 669.24:539.370

EPSHTEYN, G. N., and KAZACHKOV, I. V., Moscow Institute of Steel and Alloys  
"High-Speed Deformation of Nickel Single Crystals"

Sverdlovsk, Akademiya Nauk SSSR, Fizika Metallov i Metallovedeniye, Vol 29,  
No 1, Jan 70, pp 212-215

Abstract: An investigation was made of the effect of the high-speed deformation of nickel single crystals (99.97%). Samples cut from a crystal were polished electrolytically in 60% sulfuric acid and vacuum annealed at 550°C. The orientation of samples was determined by X-ray diffraction. Three crystal orientations were used, in tests: the first close to [110], the second [111], and the third [112]. These orientations coincided with the strain direction. The impulse strain was applied at a speed of  $10^4 \text{ sec}^{-1}$  by an electromagnetic device. For comparison, samples were subjected to a quasi-static strain at a speed of  $10^{-2} \text{ sec}^{-1}$ . Samples with up to 20% deformation were investigated. The variation of the physical width of the  $\beta$  line, the disorientation of blocks of coherent dispersion, and the variation of single crystal orientation were determined by X-ray diffraction. This investigation confirmed the earlier finding that the impulse strain contributed to the action of a greater number of slip systems. Orig. art. has: 5 figures.

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UDC: 539.165.8

USSR

KAZACHKOV, V. I.

"Analyzing Methods of Measuring a Neutron Beam in the Presence of Gamma Radiation"

Moscow, Priory i Tekhnika Eksperimenta, No 4, 1973, pp 45-47

Abstract: There are three methods for measuring neutron beams in the presence of gamma radiation. The first is to measure the average ionization current of the detector; the second is to count the dispersion of the detector pulses of the detector; the third is to measure the method of measurement, three methods for discrimination of the gamma radiation are used: compensational, through amplitudes, and statistical. The first two of the neutron-beam measurement methods were described in a book (M. Gozi, et al, Upravleniye yadernymi reaktorami -- Control of Nuclear Reactors -- 1960, Atom-izdat); and the third, in an earlier paper (David A. Gwinn, et al, IEEE Trans. 1963, NS-10, No 2, p 1). In the present paper, these methods and the methods of gamma radiation discrimination are theoretically analyzed.

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UDC 669.141.241-412:658.562

USSR

OSTROUSHKO, A. V., KAZACHKOV, Ye. A., KOROTICH, I. K., KULIK, V. A., and  
YEVTYUTOV, V. P., Zhdanov Metallurgical Institute; Plant imeni Il'ich

"Improving the Surface of Heavy Plate Ingots"

Moscow, Metallurg, No 1, Jan 71, pp 23-25

Abstract: Use was made of production data on 1825 melts of carbon and low-alloy steels to study the effect of technological parameters of metal pouring on the surface quality of heavy plates produced from ingots of low-alloy steel. The processing of these data failed to establish a link between the technological parameters and the extent of the defect (double skin) on the plates. It was found that double skin is caused primarily by the oxidation of metal splashes adhering (in the process of pouring) to the inner surface of the corrugated faces of the ingot molds; the secondary cause of double skin formation are subcutaneous blowholes which are close to the surface of the ingot. The use of a graphite sulfite cellulose suspension for lubricating the ingot mold and simultaneous increase in the pouring rate make it possible to reduce the number of double-skin rejects on plates.

1/1

UDC 669.822:621.039.5

USSR

KAZACHKOVSKIY, O. D., LEBEDEV, I. G., SYCH, A. P., MATVEYEV, P. P.

"Formation of the Structure of the Core of Fuel Elements Made of Metallic Uranium During the Irradiation Process"

Radiatsion. fiz. tverd. tela i reaktornoye materialoved. -- V sb. (Radiation Solid State Physics and Reactor Material Science -- collection of works), Moscow, Atomizdat Press, 1970, pp 203-208 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 41827)

Translation: Metallic uranium (0.21% content of admixtures) was irradiated to 2% burn-up in OKh16N15M3B steel cans 4-5 mm in diameter with walls 0.35-0.4 mm thick. The volume compensating for the swelling was 15-30% (filling with He). The mean temperature of the cans was 450-600°, and the initial fuel temperature was 650-900°. On irradiation, the fuel completely filled the free volumes. The can diameter did not change in any case. There are 2 illustrations and a 3-entry bibliography.

1/1

- 80 -

1/2 019  
UNCLASSIFIED  
PROCESSING DATE--23OCT70  
TITLE--GAMMA RAY SPECTRA OF THE CAPTURE OF RESONANCE NEUTRONS BY RHODIUM,  
TANTALUM, AND GOLD -U-  
AUTHOR--(05)-BURGOV, N.A., DANILYAN, G.V., YEFIMOV, I.A., KAZACHKOVSKIY,  
O.D., PAVLOV, V.S.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(1), 89-96  
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--GAMMA SPECTRUM, RADIATIVE CAPTURE, NEUTRON ABSORPTION,  
RESONNANCE ABSORPTION, RHODIUM, TANTALUM, GOLD, GAMMA TRANSITION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1987/2003

STEP NO--UR/0048/70/034/001/0089/0096

CIRC ACCESSION NO--AP0105077

UNCLASSIFIED

2/2 019  
CIRC ACCESSION NO--AP0105077  
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--23OCT70

ABSTRACT. THE SPECTRA OF GAMMA RAYS FROM THE CAPTURE OF THE RESONANCE NEUTRONS (0.5 IS SMALLER THAN E SUBN IS SMALLER THAN 7.0 MEV) BY RH, TA, AND AU NUCLEI WERE MEASURED BY THE GLOBAL METHOD. ADVANTAGES AND DISADVANTAGES OF THE SUGGESTED METHOD ARE DISCUSSED. THE ENERGIES AND INTENSITIES OF THE GAMMA TRANSITIONS IN PRIME104 RH, PRIME182 TA, AND PRIME198 AU WERE CALCD. FROM THE EXPTL. DATA. THE ENERGIES AND SPINS OF THE LOWER EXCITED STATES OF THESE NUCLEI ARE PRESENTED AND COMPARED WITH THE ANALOGOUS DATA OF OTHER WORKS. THE NEWLY DISCOVERED STATES ARE INDICATED.

UNCLASSIFIED

USSR

UDC:621.039.525:546.799.4

KAZACHKOVSKIY, O. D., and KIRILLOV, YE. V.

"Accumulation of Plutonium for the Development of Fast Neutron Reactors"

Moscow, Atomnaya Energiya, Vol 28, No 5, May 70, pp 418-419

Abstract: Plutonium, produced in breeder reactors, is best used in fast neutron reactors. Although there are at present no fast neutron commercial power reactors in operation, the time remaining before their massive introduction can be used to accumulate plutonium for use in these reactors. This work suggests a method for determining the maximum possible storage time for plutonium before it is used in fast reactors. The time is determined by the formula

$$F_{9F} = F_{9T} (1+P)_{TCR}$$

where  $F_{9F}$  and  $F_{9T}$  are the prices of plutonium when used in fast and thermal reactors;  $P$  is the correcting norm factor. This means that plutonium produced in breeder reactors can be stored before use in fast neutron reactors for time  $T_{CR}$ , after which its price  $F_{9T}$  becomes equal to  $F_{9F}$ . Depending on various factors, this time is 3.5-7 years.

1/1

UDC: 53.083.5

USSR

KAZACHKOVSKIY, V. V., POSIN, V. P., PUZIKOV, V. A., YAKOVENKO, V. A.,  
YANUSHEVSKIY, V. A.

"A Device for Determining the Optical Difference of a Path by the St.  
Harmon Method"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki,  
No 36, Dec 71, Author's Certificate No 322747, Division G, filed 3 Jul 69,  
published 30 Nov 71, p 155

Translation: This Author's Certificate introduces a device for determining the optical difference of a path by the St. Harmon method. The device contains a light source, an analyzer, a polarizer, a  $\frac{1}{4}$ -wave plate with a photoelectric angle-of-turn pickup and display, a photoreceiver with module for marking the extremum value of the photocurrent connected to the registration unit. As a distinguishing feature of the patent, errors are eliminated in automatic determination of a whole number of orders of optical difference in a path and in finding the direction of the algebraically larger permittivity tensor by using a wedge compensator with photoelectric displacement pickup, display and registration unit which is equipped with a logical correction unit whose output is connected to the display.

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Acc. Nr.: **AP0029818**

Ref. Code: UR 0475 /

PRIMARY SOURCE: Vrachebnoye Delo, 1970, Nr 1, PP 119-122

ON EXPEDIENT TERMS OF HEALTH-RESORT TREATMENT  
OF BOTKIN'S DISEASE RECONVALESCENTS

Vishnevskiy, A.S.; Khodykin, A.V.; Vishnevskaya, Yu. S.;  
Kazachok, G.I.; Pinchukova, Ye.F. (Yessentuki)

A Study of 286 Botkin's disease reconvalescents made in 1958--1968 indicates that complex health-resort treatment of this category of patients showed best immediate and long-term results in those reconvalescents who were sent to health-resorts at early terms following discharge from the hospital (from 1 to 6 months).

REEL/FRAME

19681504

Thermodynamics

USSR

KAZADZH, L. B., MOLOTILOV, B. V., SUKHANOV, L. F., FRANTSEVYUK, I. V. and  
SHAPOVALOV, A. P., Institute of Precision Alloys, Central Scientific Research  
Institute of Ferrous Metallurgy imeni I. P. Bardin, Novo-Lipetskiy Metallurgical  
Plant

"Effect of A High-Temperature Heat Treatment Medium on the Structure and Mag-  
netic Properties of Transformer Steel"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol. 34, No. 2,  
Feb 70, pp 262-266

Abstract: The refining ability of various media in high-temperature annealing  
in industrial dome furnaces was studied by optical microscopy methods, by mea-  
suring magnetic properties and by determining the chemical composition of trans-  
former steel. Four different steel compositions were tested in the experiment  
and their concentrations of Si, C, S, N, O, Al, Mn, and H before and after an-  
nealing in a vacuum or in a hydrogen or nitrogen medium are given in tabular  
form. It was found that high-temperature annealing in dome vacuum and gas fur-  
naces did not ensure the required degree of refinement of the steel from C, N,  
O, and S impurities. Raising the degree of evacuation under high-temperature  
heat treatment of the steel in the most improved industrial furnaces also had  
little effect in improving the refinement. It was concluded that in order to

Card 1/2

USSR

KAZADZH, L. B., et al, Izvestiya Akademii nauk SSSR, Seriya fizicheskaya,  
Vol. 34, No. 2, Feb 70, pp 262-266

lower specific losses and raise the output of high-grade transformer steels,  
heat treatment should be carried out under industrial conditions in a vacuum  
higher than  $10^{-3}$  mm Hg or in dry hydrogen with a dew point  $\leq -40^{\circ}\text{C}$ .

Card 2/2

- 70 -

UDC: 669.15-194:621.785.2

USSR

GRIGORKIN, V.I., KOROTUSHENKO, G.V., KAZADZHAN, L.B., and ZAKHARENKOVA, V.I.,  
Lipetsk Branch, Moscow Institute of Steel and Alloys

"Stabilization of Residual Austenite and the Irreversible Friability in Chrome  
and Nickel Steels"

Moscow, Izvestiya VUZ -- Chernaya Metallurgiya, No 8, 1971, pp 150-152

Abstract: The results are given of an investigation into the effects of chromium, nickel, and carbon individually on the kinetics of austenite stabilization in steels with various combinations of C, Cr, Ni, Si, Mn, and Ti. There are seven such alloys, and a table of the chemical composition of each is given. The alloys were made in an induction oven, were homogenized for 20 hours at 1200° C, and were forged into ingots weighing 10 kg, which were then roasted. Stabilization kinetics were investigated in dilatometric specimens which were supercooled until the formation of 70% martensite and were then once more heated to 230-450° C and held at that temperature for an hour. The austenization temperature was 980° C. The amount of austenite and martensite were estimated from the curve plotted on a Kantor dilatometer. It was found that the degree of austenite stabilization increased 1/2

UDC: 669.15-194:621.785.2

USSR

GRIGORKIN, V. I., et al, Izvestiya VUZ--Chernaya Metallurgiya, No. 8, 1971, pp 150-152

with an increase in the quantity of martensite; hence a structure of 70% martensite and 30% austenite was chosen for the initial analysis. The degree of residual austenite stabilization was determined from the formula  $Q = (n - n')/n$ , where  $Q$  is the degree of stabilization, expressed in % form,  $n$  is the quantity of residual austenite, fixed before the temperature stabilization, and  $n'$  is the quantity of residual austenite converted to martensite when cooled to room temperature after the temperature stabilization. Experiments made to check the assumption that the interconnection between the stabilization of the residual austenite and the friability can be attributed to the same cause are described. The nature of this cause is not completely clear. Curves are given for the degree of stabilization of the residual austenite as a function of the tempering temperature for the various steel alloys.

2/2

- 85 -

172 023 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--MAGNETIC PROPERTIES OF UNALLOYED TRANSFORMER STEEL UNDER VARYING  
ANNEALING CONDITIONS -U-  
AUTHOR--(05)--GREBENIK, N.P., DEVVOTKO, V.I., KAZADZHAN, L.B., MIRONOV,  
L.V., LOSEV, K.F.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR. SER. FIZ. 1970, 34(2), 348-50  
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, PHYSICS, MECH., IND., CIVIL AND MARINE ENGR  
TOPIC TAGS--TRANSFORMER STEEL, MAGNETIC PROPERTY, ANNEALING, ALLOY  
DESIGNATION, COLD ROLLING, MAGNETIC INDUCTION/(U)00KP LOW CARBON STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1995/0180

STEP NO--UR/0048/70/034/002/0348/0350

CIRC ACCESSION NO--AP0115884

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--09UCT70

2/2 023

CIRC ACCESSION NO--AP0115884  
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE TITLE STUDY WAS CARRIED OUT WITH STEEL GRADE 08KP (C 0.065, SI TRACES, MN 0.52, P 0.015, S 0.011, NI 0.07, CR 0.07, CU 0.09, AND AL 0.01 WT. PERCENT) MELTED IN AN ELEC. ARC FURNACE. BANDS, 3.0 MM THICK, WERE SUBJECTED TO BLACK ANNEALING AT 780DEGREES, WHEREUPON THE C CONTENT DECREASED TO 0.009-0.015PERCENT. AFTER PICKLING THE STEEL WAS COLD ROLLED TO 0.50 MM THICKNESS. SPECIMENS WERE CUT OUT LONGITUDINALLY AND TRANSVERSE TO THE ROLLING DIRECTION AND ANNEALED AT 10 PRIME NEGATIVE 2 TORR AT VARIOUS CONDITIONS. MAGNETIC AGING WAS TESTED AT 120DEGREES FOR 120 HR. MAGNETIC INDUCTION SIGNIFICANTLY INCREASED WITH RISING TEMP., REACHING A MAX. AT 700-20DEGREES. THE SP. CORE LOSSES OCCURRED WITH INCREASING ANNEALING TEMP. TO 700-50DEGREES; HIGHER TEMPS. CAUSED ONLY SMALL DECREASES. INCREASING THE HOLDING TIME OVER 1.5-2 HR AT 750DEGREES HAD LITTLE EFFECT ON THE SP. CORE LOSSES. THE AGING AFFECTED THE SP. CORE LOSSES LITTLE. THE ANISOTROPY OF MAGNETIC INDUCTION DID NOT EXCEED 4PERCENT. TO PREVENT WELDING TOGETHER OF SHEETS THE ANNEALING TEMP. SHOULD BE LESS THAN OR EQUAL TO 800DEGREES AND HOLDING TIME LESS THAN OR EQUAL TO 2 HR. FACILITY: TSNIICHM IM. BARDINA, MOSCOW, USSR.

UNCLASSIFIED

USSR

KAZADZHAN, L. E., et al (Novo-Lipetsk Metallurgical Plant)

"Effect of Structural Factors on the Ratio of Specific Losses  $P_{1.0/50}$  and  $P_{1.5/50}$  of Cold-Rolled Transformer Steel"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, February 1970, pp 241-244

Abstract: The effect of structural factors on the ratio of specific losses for various amplitudes of magnetic induction was studied. The causes of variation in the ratio of specific losses depending on structural factors in cold-rolled transformer steel were considered. Five figures are given showing the variation of specific losses with such factors as duration of aging in a temperature of 120°C, rolling and trimming, temperature of heating during repeated annealing, size of the grain of the steel, and thickness of the steel sheets. A table shows the chemical composition and characteristics of transformer steel after high-temperature annealing in different media.

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1/2 023 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--EFFECT OF HIGH TEMPERATURE THERMAL TREATMENT MEDIUM ON THE  
STRUCTURE AND MAGNETIC PROPERTIES OF TRANSFORMER STEEL -U-  
AUTHOR--(05)--KAZADZHAN, L.B., MOLOTILOV, B.V., SUKHANOV, L.F., FRANTSENYUK,  
I.V., SHAPOVALOV, A.P.  
COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(2), 262-6

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TUPIO TAGS--TRANSFORMER STEEL, MAGNETIC PROPERTY, METAL HEAT TREATMENT,  
NITROGEN, HYDROGEN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1995/0189

STEP NO--UR/0048/70/034/002/0262/0266

CIRC ACCESSION NO--AP0115893

UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0115893

ABSTRACT/EXTRACT--(U) GP-U- ABSTRACT. THE REFINING ABILITY OF THE PROTECTIVE MEDIA USED IN HIGH TEMP. THERMAL TREATMENT WAS STUDIED AND ALSO THEIR EFFECT ON THE STRUCTURE AND MAGNETIC PROPERTIES OF TRANSFORMER STEEL. THE INVESTIGATED MEDIA WERE VACUUM IN THE RANGE 10 PRIME NEGATIVE3 MINUS 30 TORR, H, H AFTER PURGING WITH N 95PERCENT-H 5PERCENT, AND N 95PERCENT-H 5PERCENT. FOR THE ACHIEVEMENT OF GOOD MAGNETIC PROPERTIES THE THERMAL TREATMENT SHOULD BE CARRIED OUT AT A PRESSURE SMALLER THAN 10 PRIME NEGATIVE3 TORR. FACILITY:  
TSNIICHM IM. BARDINA, MOSCOW, USSR.

UNCLASSIFIED

1/2 025 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--EFFECT OF STRUCTURAL FACTORS ON THE RATIO OF SPECIFIC LOSSES P  
SUB1.0 OVER 50 AND P SUB1.5 OVER 50 OF COLD ROLLED TRANSFORMER STEEL -U-  
AUTHOR--(04)--KAZADZHAN, L.B., SAKIR, N.P., SUKHANOV, L.F., SHAPOVALOV, A.P.

COUNTRY OF INFO--USSR

SOURCE--IZV, AKAD. NAUK SSSR, SER. FIZ. 1970, 34(2), 241-4

DATE PUBLISHED--70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--TRANSFORMER STEEL, COLD ROLLING, MAGNETIC PROPERTY, CRYSTAL  
LATTICE DEFECT, MAGNETIC HYSTERESIS, MAGNETIC INDUCTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1995/0202

STEP NO--UR/0048/70/034/002/0241/0244

CIRC ACCESSION NO--AP0115906

UNCLASSIFIED

2/2 025

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0115906

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. IT IS USUALLY ASSUMED THAT P

SUB1.0-50 DEPENDS MORE ON THE STRUCTURE THAN P SUB1.5-50. IN THIS CONNECTION THE CAUSES WERE INVESTIGATED OF THE DIFFERENCES OF THE LOSS RATIOS AT VARYING VALUES OF THE MAGNETIC INDUCTION AMPLITUDE.

INDUSTRIAL TRANSFORMER STEEL WAS EMPLOYED IN THE STUDY. LATTICE DEFECTS SUCH AS IMPURITIES OR RESIDUAL STRESSES INCREASE THE HYSTERESIS LOSSES AND DO NOT AFFECT THE EDDY CURRENT LOSSES. IT IS SUCH DIFFERENCES IN THE EFFECT OF STRUCTURAL FACTORS ON THE LOSS COMPONENTS THAT CAUSE A VARYING CHANGE IN THE TOTAL SP. LOSS AT DIFFERENT MAGNETIC INDUCTION AMPLITUDES.

USSR.

FACILITY: NOVO-LIPETSK. MET. ZAVOD, NOVO-LIPETSK,

UNCLASSIFIED

1/2 016 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--PULSATING AURORAE IN CONJUGATE POINTS -U-  
AUTHOR--(05)-GOKHBERG, M.B., KAZAK, B.N., RASPOPOV, O.M., REDLUGIN, V.K.,  
TROYTSKAYA, V.A.  
COUNTRY OF INFO--USSR  
SOURCE--GEOMAGNETIZM I AERONOMIIA, VOL. 10, NO. 2, 1970, P. 367-370  
DATE PUBLISHED-----70  
SUBJECT AREAS--ATMOSPHERIC SCIENCES, EARTH SCIENCES AND OCEANOGRAPHY  
TOPIC TAGS--AURORA, PULSATION, GEOMAGNETIC FIELD  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1997/0156 STEP NO--UR/0203/70/010/002/0367/0370  
CIRC ACCESSION NO--AP0119152  
UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--160CT70

CIRC ACCESSION NO--AP0119152

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INVESTIGATION OF THE FEATURES ACCOMPANYING (IN MAGNETICALLY CONJUGATE POINTS) THE ONSET OF PULSATING AURORAE CONSISTING OF INDIVIDUAL SPOTS ABOUT 10 KM IN EXTENT AND SEVERAL SECONDS IN DURATION. SIMULTANEOUS FIELD RECORDINGS AND PHOTOGRAPHIC OBSERVATIONS CONDUCTED IN 1968 IN SOGRA AND KERGUELEN SHOW THAT INDIVIDUAL FLARES OF PULSATING AURORAE ARISE WITHIN ONE SECOND OF EACH OTHER AT THESE POINTS. HOWEVER, EVEN IN THE CASE OF A SIMULTANEOUS ONSET THESE PULSATIONS ARE NOT MUTUALLY CORRELATED, AND IT IS CONCLUDED THAT THEIR SOURCES HAVE A LOCAL NATURE. FACILITY: AKADEMIIA NAUK SSSR, INSTITUT FIZIKI SEMLI, MOSCOW. FACILITY: AKADEMIIA NAUK SSSR, POLIARNYI GEOFIZICHESKII INSTITUT, MURMANSK. FACILITY: LENINGRADSKII GOSUDARSTVENNYI UNIVERSITET, LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC 621.791.76:621.7.044.2:669-419.4:621.643.4.065

LISUKHA, G. P., Engineer, KHEYFETS, M. Ye., Engineer (Volgograd Ship Building Plant), ~~KAZAK, N. N.~~, Engineer, OVCHINNIKOV, A. P., Engineer, SAKHNOVSKAYA, Ye. B., Engineer, and TRYKOV, Yu. P., Candidate of Technical Sciences (Volgograd Polytechnical Institute)

"Efficiency of Bimetallic Steel-Aluminum Adapters Produced by Explosive Welding"

Moscow, Svarochnoye Proizvodstvo, No 10, Oct 70, pp 20-22

Abstract: Tests were made of a composite material produced by explosive welding of St.4S and Kh18N10T steels 3 mm thick to a cladding layer of AMg6 aluminum alloy 6 mm thick with a sublayer of AD1 technical aluminum 1.5 mm thick acting as a plasticity buffer. The tests showed that the bimetal AMg6 + St.4S has an average layer-separation resistance of 9.9 kg/mm<sup>2</sup> and a shear strength of 7.6 kg/mm<sup>2</sup>, while AMg6 + Kh18N10T has strengths of 7.0 and 6.8 kg/mm<sup>2</sup>, respectively. The AMg6 + steel produced can be used for the manufacture of adapters of various shapes for the production of steel-aluminum welded structures. The proper sequence for welding of a steel-aluminum structure to avoid overheating of the bimetal

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USSR

LISUKHA, G. P., et al, Svarochnoye Proizvodstvo, No 10, Oct 70, pp 20-22

over a broad range of welding currents was determined. If the optimal welding current values determined are exceeded, a sharp decrease in strength of the welded joints involving Kh18N10T steel occurs, as a result of its higher tendency toward overheating than St.4S.

2/2

- 74 -

1/2 024 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--NONLINEAR FREQUENCY CONVERTER OF SPECIAL GEOMETRY -U-

AUTHOR-(104)-BOKNT, B.V., KAZAK, N.S., LUGINA, A.S., SAVKIN, A.YE.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL PRIKLADNOI SPEKTROSKOPII, VOL. 12, FEB. 1970, P. 223-226

DATE PUBLISHED-----70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--FREQUENCY CONVERTER, FREQUENCY SHIFTING, CRYSTAL, GEOMETRY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1989/0916

STEP NO--UR/0368/70/012/000/0223/0226

CIRC ACCESSION NO--AP0107445

UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0107445

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DESCRIPTION OF A SPECIAL CUT OF KOP CRYSTAL CORRESPONDING TO A GIVEN TYPE OF NONLINEAR WAVE INTERACTION FOR THE PURPOSES OF FREQUENCY MULTIPLICATION (HARMONIC GENERATION), FREQUENCY SHIFTING (SUM AND DIFFERENCE FREQUENCY GENERATION), AND RETURNING OF LASER SYSTEMS. THIS ONE SINGLE CUT CONTAINS ALL POSSIBLE PHASE MATCH ANGLES REQUIRED FOR FREQUENCY CONVERSION AND TUNING WITHIN THE TRANSPARENCY BANDWIDTH OF THE CRYSTAL. IN SUCH A NONLINEAR CONVERTER, BEAM FOCUSING IS EFFECTIVELY UTILIZED TO IMPROVE CONVERSION EFFICIENCY, AND LOSSES DUE TO REFLECTION ARE REDUCED TO A MINIMUM. THE PROPOSED CONVERTER MAY BE USED AS THE BASIC ELEMENT FOR A NONLINEAR SPECTROGRAPH.

UNCLASSIFIED

1/2 021 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--STABILITY OF POLYMERIC COMPOUNDS OF ZIRCONIUM IN NITRIC ACID  
SOLUTIONS -U-  
AUTHOR--(03)-YAGODIN, G.A., CHEKMAREV, A.M., KAZAK, V.G.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. NEORG. KHIM. 1970, 15(5), 1284-9  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--NITRIC ACID, ZIRCONIUM, POLYMER CHEMICAL  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3007/1218 STEP NO--UR/0078/70/015/005/1284/1289  
CIRC ACCESSION NO--AP0136629  
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--04DEC70

2/2 021

CIRC ACCESSION NO--AP0136629

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TWO KINDS OF POLYNUCLEAR SPECIES OF UNDET. FORM OF ZR EXIST IN HNO SUB3 SOLN. IN EQUIL. WITH MONOMERIC AND STABLE "NON EQUIL." SPECIES. ONE FORM IS IN THERMODYNAMIC EQUIL. (DECOMP. ON ACIDIFICATION) AND ONE DOES NOT TEND TO REVERSIBLE DECOMP. AND TO EXTN. BY NEUTRAL EXTN. AGENTS. THE LATTER SPECIES FORM IN THE PRESENCE OF SMALL CONCNS. OF IMPURITIES. THE CONDITIONS AT WHICH HYDROLYTIC FORMS OF ZR, HAVING OH BRIDGES, EXIST IN 2 N HNO SUB3 ARE GIVEN. EFFECT OF SO SUB4 PRIME2NEGATIVE ON DETN. OF ZR ION IN THE PRESENCE OF PYROCATECHOL VIOLET IS DISCUSSED.

UNCLASSIFIED

172 009 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--NEW BINDER FOR GUNITE TYPE CONCRETING -U-  
AUTHOR--(05)-BAKLANOV, G.M., KAZAKEVICH, E.V., PONOMARENKO, D.I., LADYGIN,  
F.F., KRIPITSER, A.M.  
COUNTRY OF INFO--USSR  
SOURCE--STROIT. MATER. 1970, (3), 26-7  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR  
TOPIC TAGS--CEMENT, BLAST FURNACE SLAG, GYPSUM, CONSTRUCTION MATERIAL  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1992/1650 STEP NO--UR/0228/70/000/003/0026/0027  
CIRC ACCESSION NO--AP0112644  
UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0112644

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FAST SETTING AND FAST HARDENING CEMENT WAS DEVELOPED FOR GUNITE TYPE CONCRETING, SO CALLED SPUTTER CEMENT. IT CONSISTED OF CLINKER WITH DEGREE OF CAO SATN. EQUALS 0.83-0.87 OCNTG. 3CAO.AL SUB2 0 SUB3 4.5-8, 3CAO.SIO SUB2 47-55PERCENT, SYNTHETIC SLAG WITH 70PERCENT 12CAO.7AL SUB2 0 SUB3, GRANUALTED BLAST FURNACE SLAG AND GYPSUM. THE BLAST FURNACE SLAG REDUCED THE COST AND INCREASED ITS RESISTANCE IN CORROSIVE MEDIA. AT A WATER-CEMENT RATIO OF 0.4 A SETTING DURATION OF 1-10 MIN WAS OBSD. IN THE 1ST 2 HK A STRENGTH OF 20 KG-CM PRIME2 WAS ATTAINED, AFTER 28 DAYS A COMPRESSIVE STRENGTH OF 250-374 KG-CM PRIME2. IN SUBTERRANEAN CONSTRUCTIONS IN DRE MINES THE SPUTTER CEMENT MET ALL THE REQUIREMENTS. IT NEEDS NO SETTING ACCELERATORS, AND THE NO. OF SERVICE PERSONNEL FOR THE PREPN. AND ADDN. OF ADDITIVES CAN BE REDUCED. A CONCRETE COATING OF 20-25 CM CAN BE APPLIED IN 1 STAGE. THE METHOD CAN BE USED NOT ONLY IN MINES, TUNNELS, SUBWAYS BUT OWING TO ITS CHEAPNESS ALSO IN CONSTRUCTION WORK.

UNCLASSIFIED

USSR

UDC 621.383:C52.21

MOSTOVSKIY, A.A., LAFUSHKINA, L.V., KUTUZOVA, T.D., KAZANEVICH, G.A.

"Photoelectronic Receiver With Semitransparent Photocathode"

USSR Author's Certificate No 252495, Filed 9 Nov 62, Published 9 Mar 70 (from  
RZh--Elektronika i yeye primeneniye, No 10, October 1970, Abstract No 10A201F)

Translation: A method is proposed for increasing the sensitivity of semitrans-  
parent photocathodes by use of the phenomenon of total internal reflection with the  
aid of an external prism of the same material as the substrate of the photocathode.  
N.S.

1/1

USSR

UDC 621.355.8(088.8)

MOZALEVSKAYA, V. A., SHIL'NIKOV, A. I., YABLOKOVA, I. Ye., KAZAKEVICH, G. Z.

"An Alkaline Battery"

USSR Author's Certificate No 300914, Filed 11/09/69, Published 26/05/71,  
(Translated from Referativnyy Zhurnal, Khimiya, No 2, 1972, Abstract No  
2 L217 P from the Resume).

Translation: An alkaline battery is suggested, for example a silver-zinc battery, containing an additional electrode (E), connected to the positive E of the battery, differing in that in order to stabilize the voltage during the process of operation of the battery, this additional E, made for example, of manganese dioxide, is made with a more positive redox potential than the positive E. The additional E is made by smearing an active mass with graphite (10%) and binder (3% PVA solution) on a copper lattice.

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1/2 013 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--BEHAVIOUR OF SILVER IN ALKALI ON ANODIC POLARIZATION BY AN  
ASYMMETRIC CURRENT -U-  
AUTHOR-(03)-KAZAKEVICH, G.Z., KIRKINSKY, V.A., YABLOKOVA, I.YE.  
COUNTRY OF INFO--USSR  
SOURCE--ELEKTROKHIMIYA, MAR. 1970, 6, (3), 361-365  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--SILVER, X RAY DIFFRACTION, ANODE POLARIZATION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--2000/0304 STEP NO--UR/0364/70/006/003/0361/0365  
CIRC ACCESSION NO--AP0124063  
UNCLASSIFIED

2/2 013

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0124063

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SOME SPECIAL CHARACTERISTICS OF THE BEHAVIOUR OF AG ELECTRODES IN ALKALI SOLUTIONS ARE DESCRIBED IN CONTINUATION OF EARLIER WORK IN THE SAME FIELD (IBID., 1966, 2, 1055). ON APPLYING AN ASYMMETRIC CURRENT, TO POLARIZE THE ELECTRODE ANODICALLY, TWO DIFFERENT FORMS OF TETRAGONAL OXIDE ARE CREATED ON THE SURFACE; THESE DIFFER IN POLARIZATION BY VIRTUE OF THEIR DIFFERING TEXTURE AND PARTICLE SIZE. IT IS ALSO POSSIBLE, THOUGH NOT CERTAIN, THAT SMALL QUANTITIES OF A MONOCLINIC OXIDE MAY ALSO BE FORMED; THESE (IF PRESENT) ARE INSUFFICIENT TO DETECT BY X RAY DIFFRACTION.

UNCLASSIFIED

USSR

KAZAKEVICH, L. A.

"Estimating the Error of One Method of Construction of a Hybrid Quasi-analogue System"

Mat. Modelir. i Teoriya Elektr. Tsepey [Mathematical Modeling and the Theory of Electrical Circuits -- Collection of Works], No 8, Kiev, Nauk. Dumka Press, 1971, pp 42-46, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V503, unsigned).

Translation: An estimate is produced of the error in solution of a linear homogeneous differential equation with constant coefficients on a hybrid quasi-analogue system by the method of compensating actions.

AA0044625

UR Q482

Soviet Inventions Illustrated, Section II Electrical, Derwent,

243272 ADDER of Patent No.197306 is modified by introducing filters 4, the outside clamps of which are connected with the lead off and through a matrix connected to the adding point of the direct current booster 2, of a high negative coefficient of intensification, a gating circuit 3 and n pairs of filters and resistances.

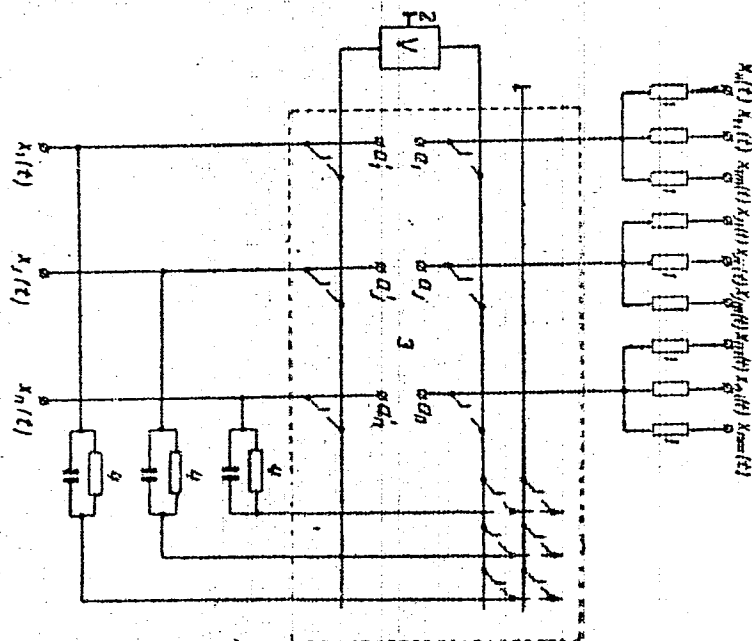
25.3.68 as 1227557/18-24.Add to No.197306.V.F.  
EVDOKIMOV et al. CYBERNETICS INST ACAD.SCIENCES USSR  
(17.9.69) Bul 16/5.5.69. Class 42m<sup>4</sup>. Int.Cl.G 06g.

AUTHORS: Yevdokimov, V. F.; Kazakevich, L. A.; Kulik, M. N.;

Institut Kibernetiki AN Ukrainskoy SSR

19771309

AA0044625



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19771310

8

USSR

UDC 591.524.12(26):639.32

YEREKEYEV, U. Ye. and KAZAKHBAYEV, S. K., Combined Institute of Natural Sciences, Karakalpak Branch, Academy of Sciences Ukrainian SSR

"Zooplankton of Aral Sea Spawning Grounds (Muynak, Adzhibay, and Dzhylytyrbas"

Kiev, Gidrobiologicheskii Zhurnal, No 3, 1972, pp 86-90

Abstract: The hydrological regime of the southern Aral Sea changed considerably during the last decade because of the installation of waterworks and drawing of water from the Amu-Dar'ya for agricultural purposes. Salinity increased, the area of the spawning grounds shrank, and the food supply of the main commercial fishes diminished sharply. Most of the spawning grounds in the southern Aral Sea - Muynak, Adzhibay, and Dzhylytyrbas, are located in freshwater bays. This study (made in 1968) revealed the presence of 56 species and forms on the spawning grounds. They consisted of rotifers, cladocerans, copepods, harpacticoids, and Dreissena larvae. The species composition was most varied on the Dzhylytyrbas spawning ground where 46 species (33 rotifer, 9 cladoceran, and 4 copepod) were found. The Adzhibay zooplankton was the least varied. Its 19 species included 12 rotifer, 4 cladoceran, and 4 copepod. The species poverty was due to the greater salinity of the water in this region. During the period under study, the

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USSR

YEREKEYEV, U. Ye. and KAZAKHBAYEV, S. K., *Gidrobiologicheskiy Zhurnal*, No 3, 1972, pp 86-90

dominant rotifer forms were *B. plicatilis* in Muynak and Adzhibay bays and *B. quadridentatus* and *L. bulla* in Dzhylytyrbas Bay. Among the cladocerans, *A. rectangula* and *Mesocyclops leuckarti* were dominant. The hydrological changes in Muynak Bay reduced the zooplankton abundance and especially biomass 6- to 10-fold by 1968 compared with the 1964 levels. The crustacean *Acanthocyclops viridis*, which constituted 33 to 80% of the total zooplankton biomass in 1964, disappeared 4 years later.

2/2

USSR

UDC 629.78.016.1

GONOR, A. L., ~~KAZAKHOV, M. N.~~, and SHVETS, A. I.

"Investigation of Supersonic Flow Past V-shaped Wings"

Nauchn. tr. In-t Mekh. Mosk. un-ta (Scientific Transactions of the Institute of Mechanics, Moscow University), 1970, No 1, pp 58-70 (from Referativnyy Zhurnal-Paketostroyeniye, No 12, Dec 70, Abstract No 12.41.164, Resume)

Translation: Flow past V-shaped wings was investigated over a broad range of geometrical parameters. Possible patterns of flow past wings are analyzed based on the results obtained, and pressure distribution at the wing surface and the location of shock waves are determined. The thrust-to-weight ratios are found as a function of angle of V-shaped wing opening by using weighted measurements. Illustrations: 11. Bibliography: 22 entries.

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USSR

UDC: 669.046.54(02)

KAZAKOV, A. A.

"Oxygen in Liquid Steel"

Kislород v Zhidkoy Stali [English version above], Moscow, Metallurgiya Press, 1972, 200 pp.

Translation of Introduction: The oxygen dissolved in steel has a great influence on steel making processes, the structure of the ingot and the quality of the finished metal. The question of the regularities which determine the concentration of oxygen in steel has been the subject of many studies, the results of which have been published in the technical literature. Most of these works concern the open-hearth process.

Steel making is undergoing great changes at the present time. Oxygen converters are gradually replacing the open hearth process. New steel making processes are being developed, in which the metal is refined primarily at the interfaces between drops of the metal and the gas phase or slag. The demand for steel with very low carbon content is increasing. The requirements for metal quality are increasing, including requirements for its purity with respect to nonmetallic inclusions. There is an increasing need for deoxidation of steel with carbon in a vacuum.

Under these new conditions, the knowledge accumulated in studies of the open hearth process has been found to be insufficient.

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USSR

Kazakov, A. A., Kislorod v Zhidkoy Stali, Moscow, Metallurgiya Press, 1972, 200 pp.

Recently, a number of original works have been published, dedicated to studies of the behavior of oxygen in the oxygen converter process, when the steel is under a vacuum, when metal drops interact with the gas phase or slag, during crystallization of large ingots. Very interesting results have been produced, although many of these results are as yet unreliable and contradictory.

This book presents a study of the regularities of change of oxygen content of metal in various steel making processes. Primary attention is given to those problems least discussed in monographs and concerning which the opinions in the periodical literature are contradictory. They include the oxidative processes developing at the division boundary between metal drops and the gas phase and slag, the behavior of oxygen in a converter and during vacuum treatment of the metal, regularities involved in formation of large, nonmetallic inclusions in ingots of rimming steel, etc.

The question of the oxygen content of metal is inseparably related to the theory of decarburization. Therefore, this book, entitled "Oxygen in Liquid Steel," must analyze the most important aspects and peculiarities of the process of oxidation of carbon. Possibly, this material will also be interesting to readers who have no particular interest in oxygen in steel.

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USSR

Kazakov, A. A., Kislorod v Zhidkoy Stali, Moscow, Metallurgiya Press, 1972, 200 pp.

The book studies methods of determination of the concentration and activity of oxygen in steel. This material is presented so that it will be more useful to those using the results of the studies than to those directly producing the results. The analysis which we present of the possible errors in these methods will allow the reader to evaluate the results of such determinations properly.

Significant attention is given to a discussion of practical methods of achieving the optimal oxygen content of the metal which steel is made in oxygen converters and open hearth furnaces, during vacuum treatment and pouring. Therefore, the book may be of interest both to researchers and to practical technologists.

The author expresses his gratitude to Doctor of Technical Sciences O. V. Travin, who edited the manuscript, for his valuable advice and suggestions.

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USSR

Kazahov, A. A., Kislorod v Zhidkoy Stali, Moscow, Metallurgiya Press, 1972, 200 pp.

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USSR

Kazahov, A. A., Kislorod v Zhidkoy Stali, Moscow, Metallurgiya Press, 1972, 200 pp.

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Acc. Nr: **AP0048275** Abstracting Service:  
CHEMICAL ABST. 5-70

Ref. Code:  
**U R 0181**

**K**

103947e Single-ion anisotropy from the mechanism of indirect exchange in rare-earth metals. Kazakov, A. A.; Andreeva, R. I. (Ural Gos. Univ. im. Gor'kogo, Sverdlovsk, USSR). *Fiz. Tverd. Tela* 1970, 12(1), 240-6 (Russ). The Hamiltonian of the indirect exchange through cond. electrons was calcd. and it is described by a strong-bond approxn. On the basis of this Hamiltonian, the single-ion energy anisotropy was calcd. which, as is shown, coincides with the anisotropy of the cryst. field mechanism. By means of a mol. field approxn., the temp. dependence and the element no. dependence of the anisotropy consts. were calcd. A. Libackyj

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REEL/FRAME  
**19791997**

1814

USSR

UDC: 621.394.142:621.376.56

VORONKOV, V. D., <sup>K</sup>~~KAZAKOV, A. A.~~, RAMOSHCHENKOV, N. A.

"A decoding Device for Cyclic Majority Binary Codes with Redundancy When There is Multiple Repetition of Messages"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzysy, Tovarnyye Znaki, No 5, 1970, p 39, patent No 261460, filed 14 Oct 68

Abstract: This Author's Certificate introduces a decoding device for cyclic majority binary codes with redundancy when there is multiple repetition of messages. The unit contains a shift register, adders, a distributor and counters. As a distinguishing feature of the patent, the device is designed for more complete utilization of the correcting capacity of the code with improved resistance to interference in reception. The mod-two outputs of the adder in the majority decoder are series-connected through the distributor to the majority check counters for all repetitions, the number of such counters being equal to the number of information symbols. The values of the information symbols are determined from the majority of the results of these checks.

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1/2 019 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--ORBITAL EXCHANGE IN RARE EARTH METALS -U-  
AUTHOR--KAZAKOV, A.A.  
COUNTRY OF INFO--USSR  
SOURCE--FIZIKA METALLOV I METALLOVEDENIE, FEB. 1970, 29, (2), 235-240  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS, MATERIALS  
TOPIC TAGS--RARE EARTH METAL, ELECTRON STRUCTURE, ELECTRON TRANSITION,  
EXCHANGE REACTION, MAGNETIC PROPERTY, ANTIFERROMAGNETISM  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3002/1675 STEP NO--UR/0126/70/029/002/0235/0240  
CIRC ACCESSION NO--AP0129045  
UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0129045

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE THEORY OF ORBITAL EXCHANGE IN RARE EARTH METALS (GD, TB, DY, HO, ER, AND TM) IS PRESENTED WITH SPECIAL REF. TO ITS EFFECT ON THEIR MAGNETIC CHARACTERISTICS. THE CONTRIBUTIONS OF INDIRECT EXCHNAGE PROCESSES ASSOCIATED WITH EXCHANGE THROUGH THE ORBITAL MOMENTS OF THE CONDUCTION ELECTRONS, LEADING TO ORDERING OF THE ORBITAL MOMENTS OF THE 4F ELECTRONS, ARE CONSIDERED. ORBITAL EXCHANGE IS IN FACT A VITAL FACTOR IN EXPLAINING A NUMBER OF MAGNETIC PROPERTIES OF THE RARE EARTH METALS, PARTICULARLY THE ANTIFERROMAGNETIC ORDERING OF THE LATTER.

UNCLASSIFIED

KAZAKOV, A. I.

SPR 5 1973

6-73

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XIV-16. DEFECTS OF LAYERS DURING EPITAXY FROM A SOLUTION IN A MELT

Article by V. A. Zayonchik, A. I. Kazakov, V. I. Kuznetsov, V. A. Kuchelnykh, Odessa: Novorossiysk, III Simpozium po Poluprovod. i Sinteza Poluprovod. nilyam, Krasnodar, 12-17 June 1972, p 206

The structural perfection of semiconductor layers of semiconducting materials is one of the basic properties determining their quality and further use in the manufacture of instruments.

In this paper a study was made of the formation and the types of structural defects in the monocrystalline layers of germanium, gallium arsenide and phosphide obtained from a solution in melts of different metals depending on the conditions of obtaining them.

It was demonstrated that the structural perfection of the monocrystalline layers depends on the state of the substrate surface before the epitaxial process, the selection of the metal solvent and the nature of variation of the thermal field in the crystallization zone. Some causes of the variation of the defect distribution with respect to thickness of the epitaxial layer were discovered.

KAZAKOV,

A. I.

DYNAMICS OF THE CONTENT OF CARBON MONOXIDE IN AN ATMOSPHERE REGENERATED BY CHLORELLA

UDC 502.264.45-111.5:746.262-31

JPRS 56030

18 May 72

[Article by A. I. Kazakov, G. I. Molebny and Yu. V. Engel'son; Moscow, Kosmicheskiye Biologiya i Meditsina, Russian, Vol 6, No 2, March-April 1972, pp 13-16, submitted for publication 20 July 1971]

Abstract: This paper presents experimental results indicating that carbon monoxide can be accumulated in the enclosed environment of a Chlorella reactor in a "man-Chlorella" system and remain at a relatively constant level. The stabilized level of the carbon monoxide content in an enclosed atmosphere may vary. It is likely to be associated with the photosynthetic activity of Chlorella cells, which as was shown previously, may absorb carbon monoxide from the atmosphere.

It is well known that carbon monoxide is formed in the process of vital functions in animals and man. Carbon monoxide is released primarily in exhaled air. In man the concentration of carbon monoxide in the exhaled air, according to data from different authors, attains 0.0028-0.011 mg/liter (Sjstrand; P. I. Bogachov, et al.; V. V. Kustov). The rate of its release, according to investigations made by Coburn, et al., is  $0.42 \pm 0.07$  ml/hour.

The endogenous formation and release of carbon monoxide into the atmosphere has also been noted for plants (Langdon; B. Rogg and G. Rogg). Including unicellular algae (Milks; Gafford and Craft; Myers; Bates; Biget). Cultivation of unicellular algae in a closed air volume results in the atmospheric accumulation of carbon monoxide in a concentration from 0.003% (Bates) to 0.06% (Gafford and Craft). According to our data (M. M. Korotayev, et al.), the carbon monoxide concentration in the air in an algae cultivator was 0.003-0.09 mg/liter and was inversely proportional to the intensity of the photosynthesis process in algae cells.

USSR

UDC 539.14.144.3

PEKER, L. K., VOIMYANSKIY, E. I., VORONKOV, Yu. P., KAZAKOV, A. L.

"Concerning the Causes of Lowering of the Levels  $s_{\frac{1}{2}}$  and  $d_{\frac{3}{2}}$ , Caused by Holes in Filled Shells"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, No 4, 1971, pp 856-857

Abstract: Since, according to results of recent research, lowering of the hole level in light nuclei is linked to a large amount of particle-hole interaction, an attempt is made to ascertain the role of such interaction in lowering of the hole levels in heavy nuclei. It is found that whereas in light nuclei the effect of lowering of the hole levels is determined by particle-hole interaction, in heavy nuclei it is determined by the effect of rearrangement of the nucleon shells. The possible causes of the decrease of particle-hole interaction in heavy nuclei are enumerated. An important cause of the weakening of particle-hole interaction in heavy nuclei is the fact that in such nuclei the particle-hole interaction is reduced to an interaction of the  $p - p$  type, whereas in light nuclei an important part is played by interactions of the  $n - p$  type. 1 table, 7 bibliographic entries.

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USSR

K  
IOFFE, I. V., KAZAKOV, A. L., Physico-Technical Institute imeni  
A. F. Ioffe, Academy of Sciences, USSR, Leningrad.

"Reflection, Refraction, and Self-Focusing of Sound Waves in  
Electrical Field"

Leningrad, Fizika Tverdogo Tela, Vol 12, No 4, April 1970, pp 1036-  
1043

Abstract: It has been shown elsewhere that in crystals located close  
to a ferroelectric Curie point, the presence of an external electrical  
field  $E$  substantially changes the acoustical properties. The  
present work investigates the laws of reflection and refraction of  
sound at the boundary of such crystals, as well as the phenomena of  
the self-focusing of sound in the electrical field. As in the case  
of a piezoelectric crystal, an additional surface wave originates  
during reflection and refraction. It is shown that the angles of  
reflection and refraction in a nonmonotonic form depend on the magnitude  
and direction of the electrical field. Focusing of the reflected  
and refracted waves is possible at certain directions of  
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USSR

IOFFE, I. V., et al, Fizika Tverdogo Tela, Vol 12, No 4, April 1970, pp 1038-1043

the electrical field. Directions of the electrical field and of the incident wave at which the reflected and refracted waves disappear and only the surface wave remains are also possible. It is also shown that the abrupt change of temperature at the boundary of the two media arising from the presence of heat flux may increase substantially in the electrical field. In conclusion, it is shown that self-focusing may take place during passage of a narrow beam of sound. The results obtained are correct in all ranges of the electrical fields  $E$  and the varying speed of sound  $S$ , except for dependence on the fact that one must take into account the variations of temperature. 2 fig. 10 ref. Received by the editors 19 October 1969.

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- 60 -

USSR

UDC 669.788:548.526

KAZAKOV, D. N., KUNIN, L. L., and LITVINOVA, N. F., Moscow

"Experimental Evaluation of the Role of Surface Reactions in Studies of Hydrogen Permeability Through Titanium, Nickel, and Copper"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, No 2, Mar-Apr 73, pp 91-95

Abstract: From the expression for the period of instability  $L$ ,  $L = \frac{1^2}{6D} + \frac{21}{3K}$ ,

at permeation of H through a membrane of thickness 1, taking into account the diffusion and kinetic resistances  $1/D$  and  $1/K$  on both sides of the membrane, the values of  $D$  and  $K$  can be determined by measuring  $L$ . The solubility can be determined from a previously given expression (Khokhrin, V. M., et al., Zh. Fiz. Khimii, 1968, 42, No 3, p 805) for the density  $j$  of a stationary flow,

$$j = \frac{S_{\text{entry}} - S_{\text{exit}}}{1/D + 2K},$$

USSR

KAZAKOV, D. N., et al., Izvestiya Akademii Nauk SSSR, Metally, No 2, Mar-Apr 73, pp 91-95

where  $S_{entry}$  and  $S_{exit}$  are determined by the pressure of H on both sides of the membrane. The methods of the experimental determination of H permeability through Ti, Ni, and Cu and the derived  $L/l$  dependences on  $l$  and temperature dependences of H solubility are shown. From the three investigated metals, a noticeable kinetic resistance to H permeation is exerted by titanium and also by nickel at sufficiently high temperatures. Specimens of Cu did not show a noticeable influence of the kinetic factor in the investigated temperature interval. Three figures, two tables, seventeen bibliographic references.

2/2

- 64 -

Organ and Tissue Transplantation

USSR

UDC: 616.12-089.843-089.168

FAL'KOVSKIY, G. E., KAZAKOV, E. N., YARLYKOVA, Ye. I., ASTRAKHANTSEVA, G. I., ALEKSEYEVA, L. A., KOBKOVA, I. D., SOKOLOV, M. V., GALANKINA, I. Ye., HOL'SHUKHINA, L. A., and GUDKOVA, R. G., Institute of Cardiovascular Surgery imeni A. N. Bakulev, Academy of Medical Sciences USSR, Moscow

"The fate of an Heterotopic Heart Allotransplant"

Moscow, Eksperimental'naya Khirurgiya i Anesteziologiya, No 6, Nov/Dec 70, pp 3-12

Abstract: Donor hearts transplanted to the iliac arteries of recipient dogs survived up to 16 days. The causes of cessation of transplant function during the first 48 hours were surgical complications (death of the recipient from the anesthetic, hemorrhages from the sutures, thrombosis). In the absence of such complications, the transplants continued to function 3 to 12 days average, (4.75 days) when immunodepressants were not used, and 3 to 8 days (average, 6.16 days) when they were. Cardiac arrest was preceded by arrhythmias, a decrease in voltage of the ventricular complex, and increase in lymphocytes in the peripheral blood following leukopenia. Immunomorphological changes in the recipient's lymphatic system preceded the morphological signs of rejection in the transplant (pronounced lymphoid-histiocyte infiltration, changes in the arteris, and metabolic disturbances in the myocardium).

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1/2 032 UNCLASSIFIED PROCESSING DATE--02OCT70  
TITLE--HEAT TRANSFER DURING THE BOILING OF FREON 113 ON THE SURFACE OF A  
VERTICAL CYLINDRICAL ROD -U-  
AUTHOR--(03)-KOVALEV, S.A., ZHUKOV, V.M., KAZAKOV, G.M.  
COUNTRY OF INFO--USSR  
SOURCE--TEPLOFIZ. VYS. TEMP. 1970, 8(1), 217-19  
DATE PUBLISHED-----70  
SUBJECT AREAS---CHEMISTRY, PHYSICS  
TOPIC TAGS--HEAT TRANSFER, CALCULATION, FREON, NUCLEATE BOILING  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1989/0770 STEP NO--UR/0294/70/008/001/0217/0219  
CIRC ACCESSION NO--AP0107312

UNCLASSIFIED

2/2 032

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0107312

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE HEAT TRANSFER OF FREON 113 (SATN. TEMP., 47.6 DEGREES AT 1 ATM) WAS STUDIED. MODES OF HEAT TRANSFER IN BOILING FREON WERE OBSD. ON 4 AND 10MM DIAM. (D) TUBES OF VARIOUS LENGTHS (L) TO GIVE L-D EQUALS 5. HEAT TRANSFER CALCN. WERE MADE ACCORDING TO S. A. KOVALEV AND L. F. SMIRNOVA (1968). OBSERVATIONS SHOWED NUCLEATE BOILING (A) AT TEMP. DIFFERENCES ( $\Delta T$ ) LESS THAN 21 DEGREES, TRANSITIONAL BOILING (B) AT  $\Delta T$  21-76 DEGREES, AND FILM BOILING (C) AT  $\Delta T$  IS GREATER THAN 76 DEGREES. THE HEAT FLOWS (Q) AT A AND B WERE SEVERAL TIMES LARGER THAN THE CRIT. Q FOR ISOTHERMAL CONDITIONS; ON A 4 MM DIAM. ROD A Q OF 2.2 TIMES  $10 \text{ PRIME}^6 \text{ W-M PRIME}^2$  WAS OBSD. WHEREAS IN THE C RANGE THE INCREASE IN Q WAS INSIGNIFICANT. EXPTL. RESULTS IN WHICH A, B, AND C OCCURRED SIMULTANEOUSLY AGREED TO WITHIN 15 AND 25 PERCENT, WITH CALCD. Q FOR 10 AND 4 MM DIAM. RODS, RESP., AND TO 30 PERCENT IN C.

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UDC 621.385.6

SOVETOV, N.M., KAZAROV, G.T.

"Application Of The Method Of Phase Plane To An Analysis Of Nonlinear Processes In TWT, KDI, And RWT"

V sb. Vopr. elektron. tekhniki (Problems Of Electronics Technology -- Collection Of Works), Saratov, 1970, pp 14-28 (from RZh--Elektronika i yeye primeneniye, No 6, June 1970, Abstract No 6A133)

Translation: The paper considers the application of the classical method of the phase plane to an analysis of nonlinear processes in traveling-wave tubes, taking into account the subdividing; klystrons with distributed interaction and reflected wave tubes. The basic parameters of these devices are computed. Summary.

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UDC: 621.385.632.001.24

KAZAKOV, G. T., KAZAKOVA, N. I., and SOVETOV, N. M.

"TWT and Trwistron Design by the Phase Plane Method"

Moscow, Radiotekhnika i Elektronika, No. 5, 1970, pp 993-1002

Abstract: The purpose of this article is to demonstrate how the phase plane method, developed for low-gain parameters and ideal electron bunching, can be used for arbitrary-gain parameters and less than ideal bunching. It is first shown that the electron grouping in the beam is more reliably estimated by the amplitude ratio of the space charge first harmonic than by the current amplitude. As the initial equations in their calculations, the authors use the shortened system of linear equations assuming low attenuation and negligible gain. The result of the calculation is a phase plane equation which permits analysis of the dynamics of the space charge and field interaction in O-type instruments. An equation for instrument efficiency is developed; this formula was checked by electron computer and was compared with experiments  
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KAZAKOV, G. T., et al, Radiotekhnika i Elektronika, No 5, 1970,  
pp 993-1002

performed earlier for an error of 1-2%. The equations developed through use of the phase plane method are applied to the traveling wave tube and the twistron, a procedure recommended by the authors. In a concluding appendix, the authors show how the shortened system of linear equations is derived.

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K  
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UDC 621.385.632

KAZAKOV, G. T., KAZAKOVA, N. I., KOVALENKO, V. A.

"Some Results of Electrical Simulation of a Traveling-Wave Tube"

V sb. Vopr. elektron. tekhnika (Problems of Electronics Technology--Collection of Works), Saratov, 1970, pp 138-145 (from RZh--Elektronika i yeye primeneniye, No 7, July 1970, Abstract No 7A134)

Translation: A simplification of the equation for a TWT is considered and it is shown that an approximate representation of the present phase of the electrons in the form of a linear initial phase makes it possible to construct an electric model of a TWT. Such models are useful during development of these devices for a quick estimate of the effect of various procedures on the output parameters.  
2 ill. 6 ref. O. Sh.

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1/2 042 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--TWT AND TRWISTRON DESIGN BY THE PHASE PLANE METHOD -U-  
AUTHOR--(03)-KAZAKOV, G.T., KAZAKOVA, N.I., SOVETOV, N.M.  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, RADIOTEKHNIKA I ELEKTRONIKA, NO. 5, 1970, PP 993-1002  
DATE PUBLISHED-----70  
SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.  
TOPIC TAGS--SPACE CHARGE, HARMONIC ANALYSIS, HARMONIC GENERATOR,  
MATHEMATIC ANALYSIS, LINEAR EQUATION, INSTRUMENT COMPONENT, TRAVELING  
WAVE TUBE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3005/0581 STEP NO--UR/0109/70/000/005/0993/1002  
CIRC ACCESSION NO--AP0132750  
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PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0132750

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PURPOSE OF THIS ARTICLE IS TO DEMONSTRATE HOW THE PHASE PLANE METHOD, DEVELOPED FOR LOW GAIN PARAMETERS AND IDEAL ELECTRON BUNCHING, CAN BE USED FOR ARBITRARY GAIN PARAMETERS AND LESS THAN IDEAL BUNCHING. IT IS FIRST SHOWN THAT THE ELECTRON GROUPING IN THE BEAM IS MORE RELIABLY ESTIMATED BY THE AMPLITUDE RATIO OF THE SPACE CHARGE FIRST HARMONIC THAN BY THE CURRENT AMPLITUDE. AS THE INITIAL EQUATIONS IN THEIR CALCULATIONS, THE AUTHORS USE THE SHORTENED SYSTEM OF LINEAR EQUATIONS ASSUMING LOW ATTENUATION AND NEGLIGIBLE GAIN. THE RESULT OF THE CALCULATION IS A PHASE PLANE EQUATION WHICH PERMITS ANALYSIS OF THE DYNAMICS OF THE SPACE CHARGE AND FIELD INTERACTION IN O-TYPE INSTRUMENTS. AN EQUATION FOR INSTRUMENT EFFICIENCY IS DEVELOPED; THIS FORMULA WAS CHECKED BY ELECTRON COMPUTER AND WAS COMPARED WITH EXPERIMENTS PERFORMED EARLIER FOR AN ERROR OF 1-2PERCENT. THE EQUATIONS DEVELOPED THROUGH USE OF THE PHASE PLANE METHOD ARE APPLIED TO THE TRAVELLING WAVE TUBE AND THE TWISTRON, A PROCEDURE RECOMMENDED BY THE AUTHORS. IN A CONCLUDING APPENDIX, THE AUTHORS SHOW HOW THE SHORTENED SYSTEM OF LINEAR EQUATIONS IS DERIVED.

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UDC: 681.332.65

SHAGIAKHMETOV, F. M., TAMARKIN, M. B., KAZAKOV, I. F., SUBBOTIN, V. A.

"A Variable-Priority Device"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 4, Feb 71, Author's Certificate No 292155, Division G, filed 14 Aug 69, published 6 Jan 71, p 130

Translation: This Author's Certificate introduces a variable-priority device which contains registers, decoders, coincidence circuits, merging circuits, comparison circuits and flip-flops. As a distinguishing feature of the patent, the device is simplified by incorporating a gated cycle counter and a gated cycle decoder with auxiliary merging circuits and coincidence circuits in each priority position. The inputs of the auxiliary merging circuit are connected to the inverse outputs of the coincidence circuits and to the inverse outputs of the decoder which correspond to the highest priority. The output of the auxiliary coincidence circuit is connected to the controlling input of the gated cycle counter, the output of this counter being connected through a decoder to the line for the change in the index of priority for the given position.

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USSR

KAZAKOV, I. Ye.

"Estimate of the Accuracy of a Method of Statistical Linearization of the Investigation of Automatic Systems"

Tr. IV Vses. Soveshch. po Avtomat. upr., 1968. Teoriya Avtomat. upr. [Works of Fourth All-Union Conference on Automatic Control, 1968. The Theory of Automatic Control], Moscow, Nauka Press, 1972, pp 185-192, Discussion 256-262 (Translated from Referativnyy Zhurnal, Kibernetika, No 3, Moscow, 1973, Abstract No 3 V278 by the author).

Translation: Suppose an automatic system is described in a vector-matrix manner by the equation system  $\dot{y} = \phi(t, y)$ . The approximate solution for the first two probability moments of the coordinates of the system can be determined by the method of statistical linearization. Suppose this solution is  $y(t)$ , the precise solution of the initial system is  $y(t) + \Delta(t)$ , where  $\Delta(t)$  is the error in the approximate solution.

The accuracy of the approximate solution can be estimated using moments of the vector column of the deviation  $\Delta$ . A system of equations is presented for the mathematical expectations of the estimates.

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Acc. Nr: **AP0040871**

Ref. Code:

**UR.0103**

PRIMARY SOURCE: **Avtomatika i Telemekhanika, 1970, Nr 1, pp 45-53**

**STATISTIC INVESTIGATION OF NONLINEAR AUTO-OSCILLATORY  
SYSTEM UNDER NONSTATIONARY CONDITIONS**

**Yevlanov, L. G.; Kazakov, T. Ye.**

There is considered the problem of determining the correlation functions of the phase coordinates of nonlinear systems under nonstationary conditions on the basis of the method of statistic linearization. It is shown that the application of the method allows to effectively investigate transient processes and moving conditions in auto-oscillatory, extremal and in variable structure systems under random initial conditions and disturbances as well as to analyse transient processes in auto-oscillatory systems in the absence of random disturbances.

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UDC 558.574.2

KAZAKOV, L.YA.

"On The Reflecting Capability Of Some Surfaces In The Optical Wave Band"

Radiotekhnika i elektronika, Vol XVII, No 6, June 1972, pp 1309-1312

**Abstract:** The experiments were conducted under laboratory conditions on an apparatus which made it possible to determine the indicatrices of diffuse reflection for various angles of incidence. Measurements were made with a monochromatic radiation source  $\lambda = 0.63$  micrometer. The polarization of the radiation was linear. Graphs are shown of the indicatrices of diffuse reflection for some natural surfaces and the normalized indicatrices of the diffuse reflection for concrete. The coefficient of inverse diffuse reflection for various substances obtained at normal incident of the ray at the surface ( $\theta = 0^\circ$ ) and angle of reflection ( $\theta = 2$ ) is presented in a table. 2 fig. 1 tab. Received by editors, 28 April 1971.

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USSR

UDC: 533.69.01+533.662.013

GONOR, A. L., KAZAKOV, M. N., and SEVETS, A. I.

"Experimental Investigation of Ultrasonic Flow Around V-Shaped Wings"

Nauchn. tr. In-t mekh. Mosk. un-ta (Scientific Transactions of the Moscow University Institute of Mechanics) 1970, No. 1, pp 58-70 (from RZh-Mekhanika, No. 2, Feb 71, Abstract No. 2B339)

Translation: Results of the experimental investigations of ultrasonic ( $M = 4.0$ ) flow around triangular V-shaped wings in a wide range of variation in the geometric parameters of the wing. Wing angles of from 0 to  $180^\circ$  and attack angles of from 0 to  $15^\circ$  were studied. In the experiments, the pressure distribution along the wing surface and its trace (along the axis of symmetry) the positions of the condensation jumps, and the aerodynamic quality of the wing were studied, the last with weight measurements. Changes in the nature of the flow observed with changes of angle were analyzed. An increase in the aerodynamic quality was noticed with reduction in the wing angle, the result of a drop in the coefficient of frontal resistance. B. I. Bakum

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GONOR, A. L., KAZAKOV, M. N., SHVETS, A. I., SHEIN, V. I., Moscow

"Aerodynamic Characteristics of Star-Shaped Bodies at Supersonic Velocities"

Moscow, Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti i Gaza, No 1, January-February 1971, pp 97-102

Abstract: Some results of an experimental analysis of the aggregate aerodynamic characteristics of star-shaped bodies at supersonic velocities and a study of the flow pattern in the wake behind a star-shaped body in a broad range of Mach numbers from 2.5 to 8.0 and with variation of the angle of attack from 0 to  $+8^\circ$  are presented. The aerodynamic characteristics of two models of star-shaped bodies with from 4 to 6 points were obtained during the study. A comparison was made with the characteristics of the equivalent cone and the characteristics of a "star" with 10 points. A calculation of the drag and position of the compression shocks was made for comparison with the experimental data.

An optical study of the streamlining spectrum is presented with Schlieren photographs and graphs showing the geometry of the Mach configuration as a

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USSR

UDC 621.791.859.71:613.48

OLEYNIKOV, K. A., Engineer, KORNEYEV, A. D., Engineer, ZUSEV, V. YA., Engineer, (Zhdanov Institute of Metallurgy), and KAZAKOV, M. P., Engineer (Zhdanov Heavy Machinery Plant)

"Ozone Concentration in the Working Area During Aluminum Welding"

Moscow, Svarochnoye Proizvodstvo, No 7, Jul 70, pp 48-49

Abstract: A study was made of ozone contamination of the working area during automatic welding of aluminum. The study was made under laboratory and plant conditions. The procedure for determining the ozone concentration is based on the ozone-potassium iodide interaction ( $2KI + H_2O + O_2 = I_2 + 2KOH + O_2$ ). The ozone concentration under plant conditions was determined in welding 25-mm-thick panels of railroad containers made of A5 aluminum, and also in welding annular joints inside containers. Experimental procedures are briefly described, and averaged results of 10 experiments are presented in a table. With the relative instability of ozone taken into account, measurements were taken in order to determine its concentration at various distances from the arc, in the vertical and horizontal directions. A schematic experimental setup and the dependence of concentration on distance in both directions are presented. Ozone concentration at

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OLEYNICHENKO, K. A., et al, Svarochnoye Proizvodstvo, No 7, Jul 70, pp 48-49

the welder's respiratory level was found to be  $0.44 \text{ mg/m}^3$  (under the shield) and  $0.52 \text{ mg/m}^3$  (in front of the shield) in panel welding, and  $2.26 \text{ mg/m}^3$  and  $4.16 \text{ mg/m}^3$  in welding inside the container. These figures are substantially higher than the admissible level ( $0.1 \text{ mg/m}^3$ ). Local exhaust ventilation is recommended for the reduction of contamination. 1 figure, 1 table, 4 references.

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